



## Personal Alert and Tracking System (PATs)

### Why it's Needed

Developing systems to locate and track firefighters is critical to their safety when fighting wildfires. Current personal alert systems can tell a commander that a firefighter is in trouble, but the location of the firefighter in distress has to be verbally reported. This is a challenge when firefighters are not able to communicate or are not familiar enough with the region to reliably pinpoint and communicate their own location. In addition, current systems lack integrated sensors to detect common dangers not immediately detectable by the firefighter, such as the presence of a fallen live wire. Without reliable alert and tracking devices, our nation's firefighters are at risk every day when responding to emergencies.

### How it Works

The Science and Technology (S&T) Directorate's Personal Alert and Tracking System (PATs) wirelessly alerts dispatchers of a firefighter's status and location with an accuracy within 10-meters. Sensor alerts, which detect status information such as temperature, the presence of an electric field, and the detection of impact, and firefighter location information is then received by the dispatcher in a form that can then be visually displayed on online maps and overlaid with other fire information as needed. Firefighters are also able to proactively send out distress signals to inform rescuers of their locations, while onboard sensors automatically alert the firefighter and dispatch of any present environmental hazards.

The sensor web architecture allows for signal hopping among all units that greatly enhances communication range and reliability. With an open, standardized architecture, PATs provides the capability to install additional sensors in the future.

### The Value

There is currently no device that will automatically inform incident commanders when firefighters are unexpectedly in danger. PATs provides the tracking and alerting capabilities critical to the safety of firefighters by informing incident commanders of the locations of deployed wild land firefighters, and send firefighters audio, visual, and text alerts when situations rapidly change. At a cost expected to be below \$100 per unit, PATs will be reliable and compact, yet rugged, and affordable to local fire departments. PATs can also be used in Urban Search and Rescue to track searchers and the path they covered.



### Next Steps

The first prototypes of PATs will be transitioned to the U.S. Forest Service and California Department of Forestry and Fire Protection for test and evaluation. Upon completion, S&T will partner with industry to encourage the commercialization of an affordable PATs product that local, tribal, state and Federal first responders can use to save lives.